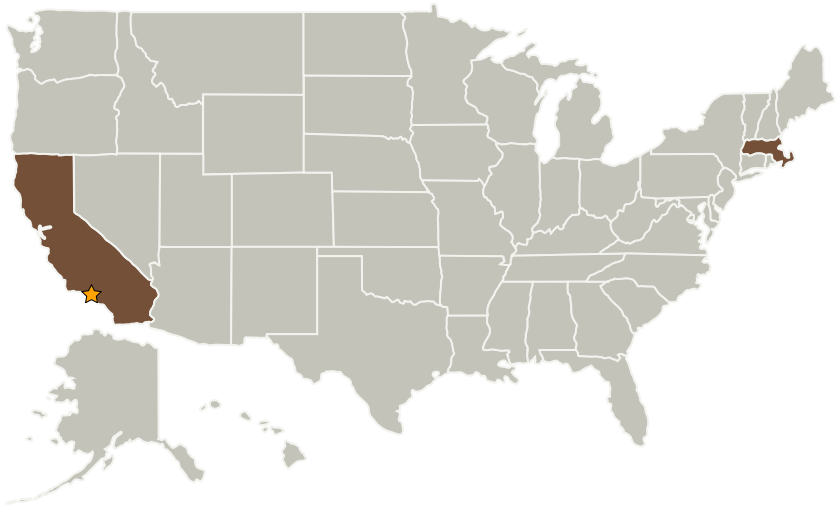
A Novel Low-cost, Ka-band, High Altitude, Multi-Baseline Unmanned Aerial Vehicle Sensor for Surface Water Ocean Topography, Phase I

Completed Technology Project (2009 - 2009)

Project Introduction

The NRC Decadal Survey recommended the Surface Water Ocean Topography (SWOT) satellite mission to address terrestrial fresh water hydrology and physical oceanography science questions. The proposed effort will develop a low-cost, Ka-band, multi-temporal baseline radar sensor designed to fly on high altitude unmanned aerial vehicle (Global Hawk) and acquire phenomenology (i.e. temporal, coherence, near-nadir scattering cross-section and vegetation attenuation) measurements in support of the SWOT mission. To realize this sensor, innovations in the sensor design, transceiver digital receiver and antenna are required. The Phase I will result in a system design for these subsystems that can be realized in a Phase II effort. During the Phase I, analytic studies and modeling will be performed to demonstrate feasibility and to perform the necessary tradeoffs. Leveraging a high altitude, FPGA-based digital receiver system developed by RSS and its development system, the digital receiver capabilities will be extended and initial laboratory testing performed. The Phase II effort will realize a prototype of this sensor.At the end of the Phase I, a technology readiness level of 3 will be achieved.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California
Remote Sensing Solutions, Inc.	Supporting Organization	Industry	Barnstable, Massachusetts

Primary U.S. Work Locations	
California	Massachusetts

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.4 Microwave, Millimeter-, and Submillimeter-Waves